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ABSTRACT

The paper considers issues in intelligence testing of learning disabled (LD) children and adults and reviews results of psychological testing of LD students at the University of Virginia (UVA). Tests administered include neurological screening tests and personality assessments where appropriate. It is explained that the matriculating LD student is academically competitive with many peers. Intellectual/cognitive data of 62 UVA LD students are presented, and it is noted that learning difficulties of many students went undiagnosed before entrance No general pattern in test scores was found to exist, although subgroups of the sample evidenced differences on both IQ and subtest scales. Analysis of coping styles pointed up the need to reduce depression and reinforce autonomy and individuation. (CL)

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Psychological correlates of college students referred to a learning needs center

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Psychological Correlates of College Students Referred to a Learning Needs Center

This chapter presents the results of psychological testing of college-age students who have been referred because of suspected learning disabilities. The first section of the Chapter is to acquaint the reader with the role of the psychological consultant as it is practiced at the University of Virginia (UVA), and to examine this relationship with learning disabled students within the broader scope of general trends in counseling centers today. The next part of the chapter describes the educational hurdles the learning disabled student faces to actually become a UVA undergraduate. A brief review of intelligence testing with learning disabled children and adults is presented to provide a framework in which to assess the results of the intellectual/cognitive data gathered at UVA which then follow. The portion of data investigating personality variables in this population is included in the subsequent section. The conclusion to the chapter summarizes the results of the present data and offers several suggestions for future research endeavors and practical applications.

The Role of the Psychological Consultant

Since the Fall of 1981, the Counseling Center of the University of Virginia has played a major supportive role with the University's Learning Needs and Evaluation Center (LNEC). The major responsibilities of the LNEC lie with program accessibility for the handicapped. As a consequence, its largest group of consumers are students with learning disabilities. The Counseling Center cooperates with the LNEC by providing a psychological consultant on a part-time basis (up to 8 hrs./week)

to conduct psychological evaluations, individual and/or group counseling. The vast majority of students seen by the consultant are referred by LNEC; however, several students have sought out the Counseling Center's services initially because of academic problems and the lack of knowledge about the LNEC.

Most diagnositc tests to determine the presence of a learning disability (LD) in a particular student are administered by LNEC staff. Referrals for additional testing by the psychological consultant are made whenever questions to be addressed by LNEC include modifications of regular academic requirements, or whenever a psychological/emotional handicap is suspected by the LNEC staff to be contributing to the student's academic difficulties.

Most students referred to the psychological consultant receive an intellectual/cognitive assessment with the WAIS (currently, the WAIS-R). In the 1981-81 academic year, the previous consultant also administered projective tests to most referrals. Commencing in the Fall of 1981, this practice was curtailed for several reasons:

(1) The projective tests were not documenting emotional handicaps in the large proportion of students.

(2) Given the amount of time students were already spending in various evaluative procedures at the LNEC (up to 8 hours), another 1 to 1½ hours to respond to a projective instrument seemed inappropriate given the low incidence of emotional difficulties that were involved in their academic problems.

(3) Consultant time had averaged 4 hours per student in face-to-face contact. This did not include time spent scoring, interpreting, and preparing a report of the test results. With only 8 hours a week to devote to LNEC referrals, the elimination of routine projective assessments cut time spent/student in half. The result was an increase in the rate and number of students that could be seen by the consultant weekly.

(4) Finally, the questionable validity and reliability of the projective tests to provide accurate psychological data renders any evidence they provide - one way or the other - inconclusive even when psychological difficulties are suspected (cf. Anastasi, 1982, p. 580-591).

Currently, personality assessments are given only when either the LNEC staff directly requests them or when the consultant deems it appropriate. The result of this change in policy has been a drop from 24 personality assessments in the 1980-81 academic year to only 4 such assessments from the Fall of 1981, to January, 1983. In the 4 subsequent personality assessments the MMPI has been utilized to augment a clinical interview. The choice of the MMPI rests on its much stronger empirical base in diagnosing psychological difficulties, and the fact that it can be self-administered - thereby maximizing the consultant's time to see referrals and carry-on other responsibilities at the Counseling Center (Golden, 1979, p. 102).

Another shift of emphasis has been to administer more neurological screening tests to current referrals. This data is not included in the present report as this practice only began in the Fall of 1982. However, we are experimenting with the Bender-Gestalt, The Trails Making Test, and the Stroop Word-Color Interference Test. The latter seems particularly useful in corroborating WAIS-R findings, as well as suggesting possible neurological dysfunctions not detected by the WAIS-R. Its quick and easy administration (about 10 minutes) seems worth the effort at this point in our experience with it. Since implementing these procedures our referrals for more substantive neuropsychological assessments (e.g. Halstead-Rertan battery) by the Neuropsychological Assessment Service at the University Hospital have increased from 1 for 1981-82 academic year to 3 for the Fall, 1982, semester.

To put the UVa program within a larger context, the results of a survey sent to Counseling Centers in the U.S. inquiring as to the range and type of services they provided to learning disabled students are important (Lachar, Note 1). Of the 175 centers which responded (60%), ½ of the center directors reported no institutional policy with

regard to LD students. In addition,

(1) 1/3 reported no agency, department, or person within the university/college with a formal role in aiding LD students requesting academic exemptions.
(2) The average number of LD students/year served by a center was 8. There was a wide variation reported among schools not accounted for by the size of the student body.
(3) The most often reported services included consultation and testing.
(4) The least likely services to be offered were remedial ones.
(5) Slightly less than half of the directors expected to increase services to this population; a similar percent expected services to remain at the same level; a small percentage of the directors expected their services to the LD population to decrease in the next few years.

When compared to this data, psychological consultation services offered to the LNEC by the UVA Counseling Center appears to be above average in terms of the number of students seen and the kinds of services offered to LD students. It consists of a part-time consultant whose major responsibility is to provide psychological assessment for students referred to the LNEC for either academic modifications or suspected emotional handicaps which may compromize their ability to successfully complete their academic requirements. Individual and group counseling services are also provided though these are less often utilized by this population. While the assessment centers on intellectual/cognitive evaluation, the secondary focus has shifted from personality dynamics to neurological dysfunctions which may be contributing to the students' academic difficulties.

The University of Virginia Learning Disabled Student.

The criteria for admission and for financial aid at UVA are the same for the learning disabled person as for any other applicant. The only exceptions are that the Office of Admissions will accept untimed SAT's and scores obtained with a reader or scribe. After admittance students are invited to self-declare any LD condition or other physical handicap.

In contrast, the admissions procedure of Aldelphi University reported by Barbara (1982) requires of LD Applicants:

(1) High School transcripts
(2) Untimed SATs
(3) A handwritten essay
(4) WAIS
(5) school records or other documentation of a handicapping condition
(6) a recent Individualized Educational Plan
(7) a letter of recommendation from the high school learning disabilities specialist
(8) interviews by the Director of Admissions, Assistant Director of Educational Services and of Social Services with the applicant and, separately, with the parents.

The purpose of this contrast in admissions procedures is to underline the differences that exist between LD students enrolled at UVA with LD students at many other colleges and universities. In the UVA admissions procedure only limited consideration is given to the presence of a learning disability. This results in a student sample in which one of the following conditions exists: either the student has been diagnosed as LD, but can compete with non-LD cohorts, or the matriculating student has not been diagnosed as LD and has managed to succeed in the academic environment without any additional supports. Our experience is that the latter circumstance is most often true: the LD students seen at UVA usually have never been susrected or diagnosed as having a learning disorder prior to their contact with LNEC. In either case, the following statistics of the 1982 entering class bear attention. The LD student at UVA

(1) was among the 22% of applicants who eventually enrolled at the University.
(2) was among the 79% of students who were ranked in the top 20% of their secondary school class; 57% in the top tenth.
(3) if accepted to the College of Arts and Sciences had a mean Verbal SAT of 579, and a mean Math Sat of 613 (Math SATs are higher for the entering classes in the Schools of Engineering and Architecture) (University of Virginia, Note 2)

In summary, the UVA LD student is most likely atypical of LD students in college settings. This is because unlike some other universities and colleges, there are no special considerations given to LD applicants. Despite the presence of learning handicap, the matriculating LD student is academically competitive with many of his/her peers.

Intellectual Testing to Discriminate the Learning Disabled.

In order to provide a framework in which to view the results contained in the next section, a brief summary of intelligence testing with learning disabled populations in appropriate. Without question the largest volume of literature exists which examines WISC-R scores in LD children. A recent review by Galvin (1981) noted the often found factor structure of the WISC-R in this population as consisting of Verbal Comprehension (Vocabulary, Information, Comprehension, Similarities), Perceptual Organization (Block Design, Object Assembly, Picture Completion, Mazes). and Freedom from Distractibility (Arithmetic, Digit Span, Coding). While much effort has been expended to discriminate LD from non-LD children based on one or more of these factor scales, the results have been less than impressive. In addition, no pattern of scores on the WISC-R has emerged which can characterized the "typical" LD child. Galvin's conclusions are that such homogeneity of test scores in this population is unlikely given the heterogeneity of problems subsumed by the label "learning disabilities," and that sub- patterns of responses related to specific disabilities may be more useful.

The research base concerning college students with learning disabilities is miniscule. The literature examining intellectual assessment data is limited to that of Cordoni et al (1981): the only study I am aware of which addresses this particular concern. Cordoni

and associates compared the WAIS scores of 57 previously diagnosed learning disabled young adults with 17 "control" students. Univariate analyses showed significant differences between the two groups on 5 subtests: Information, Similarities, Vocabulary, Digit Span and Digit Symbol.

The more notable components of this study are the multiple discriminant analyses (MDA) they conducted to derive multivariate models to separate the two groups. Their initial MDA, which attempted to separated the two groups based on their scores on the WAIS subscales, found that 85% of the students could be correctly group based on their scores on Information, Digit Span, and Digit Symbol.

Their next analysis using the MDA procedure focused on the Bannatyne factors often employed with children to discriminate LD from non-LD children. Cordoni et al's results found that the Sequential (Digit Span, Arithemetic, Digit Symbol) and Acquired Knowledge (Information, Arithmetic, Vocabulary) factors significantly discriminated between their two groups with an overall classification rate of 76%.

Finally, these authors also looked at the discriminatory power of another set of intelligence factors often used among children — ACID (Arithmetic, Coding, Infomation and Digit Span). Using these four subtests of the WAIS (substituting Digit Span for Coding) in an MDA produced a significant multivariate model with correctly classified 84% of their two groups.

As we move into the data from the UVA sample of LD students, the brief review of intellectual/cognitive data just presented should serve several warnings. First, in looking at out data, recognize that it is only the first set of published results which examines psychometric

properties of the WAIS in a college LD population. Be wary of over-generalizing from this data, and keep in mind Galvin's (1981) comments that general patterns of performance should not be expected - or projected. Also, this data is not being compared with a representative "control" sample; it is purely descriptive. As we begin to develop a larger pool of intellectual and cognitive data from non-LD UVA students, then distinction may be possible. And finally, this is most likely a very special population of LD young adults.

Intellectual/Cognitive Data of UVA LD Students.

This sample consists of 62 students referred by the LNEC for psychological evaluation in the 1980-81 and 1981-82 academic years. It includes 41 males and 21 females with a mean age of 21.9 years. The descriptive data and WAIS scores for this sample are presented in Table 1. Notable immediately is the Full Scale IQ mean of 118, equivalent to the 87th percentile of the standardization sample. Subscale scores range from 11.4 (Picture Arrangement) to 13.5 (Similarities and Block Design). An analysis of the subtest scatter among these mean scores showed no inter-test scatter which reached the .15 level of significance. Verbal-Performance discrepancy was negligible and not unexpected at this educational level.

Insert Table 1 Here

Table 2 displays the results of a principal components factor analytic solution with a varimax notation for the WAIS subtest scores of the entire sample. Four factors were extracted with eigenvalues greater than 1.0 which accounted for 65.8% of the total variance. These factors included:

(1) Academic Skills: Information, Vocabulary, Arithmetic.
(2) Perceptual Abstraction: Picture Arrangement, Block Design, Picture Completion, Object Assembly.
(3) Closure: Comprehension, Digit Span, Picture Completion
(4) Verbal Fluency: Comprehension, Information, Vocabulary, Similarities.

Insert Table 2 Here

Digit Symbol was not highly loaded in a positive direction on any of the factors. It was, however, highly negatively loaded on Verbal Fluency.

Insert Table 3 Here

Among students referred for psychological testing, 75% of them were seeking academic modifications specifically in the area of foreign language requirements. As shown in Table 3, these students were found to differ from those referred for other reasons on the Information and Vocabulary subtests. Students seeking a foreign language waiver were found to score lower than "other" students on each of these subtests as well as on Full Scale IQ. The MDA model to discriminate between these two referral groups was significant ($p=.01$) and correctly classfied 79% of the students. While the model was highly successful at correctly categorizing "waiver" referrals, it produced many false positive identifications of students actually referred for other reasons. Consequently, the model would appear to have limited utility to screen students with potential foreign language learning difficulties.

Insert Table 4 Here

In the MDA x sex results (Table 4), two significant differences between the sexes were found for Information and Digit Symbol when univariate analyses were performed. The MDA model contained 7 variables which, when combined, correctly classified 90% of the males and 67% of the females. These differences on the MDA model appear based on the general trend for females to score higher on Performance tasks and males to do better on Verbal tasks.

Insert Table 5 Here

Table 5 summarizes the results of the MDA x race analysis. Race differences were found on 7 variables using univariate F - tests; in all cases blacks scoring lower than whites (Note: the Digit Difference score indicates the Digits Forwards – Digits Backward difference. In this case, the higher score for blacks indicates a larger difference, therefore a "lower" score). The eleven variable MDA model documents more variable differences between races when they are considered simultaneously. This model correctly classified 52 of 53 white students, and 8 of 8 black students. However, given the low number of black students these data bear future replication with a larger sample.

The data in Table 6 are based on a sub-population of LD students who are in graduate school (n=4). While the question of what characterizes LD students in college is our present concern, and even more intriguing question is how do they then get to graduate school (in these cases, 1 MBA, 2 Medical School, 1 Ph.D. History)? Curiously, Performance IQ seems the most important variable whether using univariate or multivariate models. Block Design, Vocabulary and Information subtests also differentiate the undergraduate from graduate student; however, they are less efficient discriminating graduate from undergraduate students (50%). As in the last analysis, the number of graduate members in this sample is quite small and the results are in need of further elaboration in future studies.

Insert Table 6 Here

Personality Variables in the College LD Population.

Mirroring the little work done with intellectual characteristics of LD college students, scant attention has been paid to psychological/emotional variables in this population. One report by Abrams (1967) emphasizes the diagnostic and therapeutic functions of the clinical psychologist vis-a-vis this population. Abrams states the psychologist's role as seeking to establish a "causal role" of emotional conflicts in learning problems by the use of projective testing and other assessment procedures to document a possible thought disorder. Once this role is established, Abrams recommends initiating psychotherapy in which a major problem to contend with is the student's refusal to recognize this relationship. Abrams' view of the impetus of assessment as diagnosing emotional conflicts does not seem justified by our own data. In only two cases of our 68 referrals have emotional conflicts been documented as having a potential contributing role to academic difficulties. His concern does deserve attention in that people of college age are among those at the highest risk for the emergence of a thought disorder (Coleman, Butcher and Carson, 1980, p. 396). To neglect this possible confounding variable would be quite harmful to the student in that it would delay the student's receiving appropriate care. However, more often is the case outlined by Vogel (1982) where LD adults have specific social/interpersonal skills deficits which may be independent of psychopathology. Among these deficits Vogel cites:

(1) making and keeping friends
(2) knowing what to say and how to interact appropriately with a variety of individuals
(3) understanding social cues such as facial expression and body language
(4) knowing how to join a group of people in conversation and enter into the discussion without interrupting the flow

Our own studies of LD college students employing personality assessment instruments have delineated two basic categories of students: what I call successful (or "positive") copers vs unsuccessful (or "negative") copers. Of the 28 students we have conducted personality assessments with, Table 7 summarizes the descriptors of these two coping styles. These two styles, or sets of descriptors, are based on the personality sketches included by one of the two consultants in their final reports. What this means is that the Table 7 data reflects the incidence of a particular descriptor when the consultant believed it necessary to include. Because no standardized objective checklist was given to all students, the data respresents clinical impressions the consultant formed based on the test results. Therefore, the incidence of the true rate of each descriptor in the UVA sample is most likely underestimated. This should be equally true for both the "positive" and "negative" ones.

Insert Table 7 Here

Among "positive"descriptors, the characteristics of determination, achievement oriented, and creative predominate. The most frequent "negative" descriptors include depressed, authority-dependent, hopelessness, and socially isolated. In each individual student's case, these descriptors appear to separate the successful from non-successful student in coping with his/her learning problem. In one instance we see an increased amount of determination, goal orientation and creativity in their lives. In the other case depression, a sense of hopelessness, a very dependent relationship with authority figures(parents, teachers) and social isolation pervade the clinical picture. We believe that in the vast majority of cases these negative characteristics are secondary, not primary, contributions to learning problems. Relegating them to secondary importance does not, however, deny the significant impact they have on the student's life. What they do suggest is that more systematic study of the ways in which some LD students successfully cope with their disability may provide us with a sound basis from which to intervene with the poor copers.

Conclusions and Future Directions.

The data presented in this chapter outline the intellectual and personality correlates of college students who as a group fall within the "Bright-Normal" (or High Average) range of intellectual capacities. In most cases, these students have gained admission to college despite learning problems which have gone undiagnosed. For many students these learning difficulties were not recognized until the student reported extreme problems in mastering the foreign language requirement.

Within this sample there were no significant differences among scaled scores. This is not to mean that in individual cases such discrepancies are not noted: most often they are. However, no general pattern was found to exist for this group. This indicates that future

work in this population may be more useful if it focuses on specific intellectual/cognitive patterns for specific subgroups of LD college students.

The factor structure of the WAIS included 4 factors. The first, Academic Skills, compares to Bannatyne's "Acquired Knowledge" factor of the WISC-R. The Perceptual Abstraction factor likewise finds its match with the "Perceptual Organization"factor of the WISC-R noted by Galvin (1981).

The third factor, consisting of Comprehension, Digit Span and Picture Completion has been tentatively named "closure." The reluctance to firmly hold to this designation is because of the lack of any perceivable reason, inherent in these 3 subtests,for them to be grouped together. In an attempt to determine whether this factor might have been a statistical artifact of the factor solution employed, a second factor analysis using a principle axis solution was conducted. The results of this strategy were a first general factor, a second factor including Comprehension (.78), Picture Completion(.69), Digit Span (.63) and Similarities (.51), the perceptual organization factor and a fourth factor which reflected the fourth factor of the principal components solution (Perceptual-Motor Speed vs Verbal Fluency). Again, the principle axis solution generated a very strong "closure" factor which also included the Similarities subtest. The implication of these same results generated by two different solution strategies is that these 3 or 4 subtests may compose a factor unique to this population. Cautiously, one may say unique to college LD students. The emergence of this factor does offer promise in providing a possible fulcrum on which many decisions regarding the presence of a learning disability in this population may be balanced. Clearly, further work is necessary to replicate this factor among other

groups, as well as its validity in discriminating groups of LD and non-LD students.

Analyses of subgroups of the UVA sample revealed differences on both IQ and subtest scales. Students referred for language waivers were found to have lower PIQ's, Vocabulary and Information scores than students referred for other reasons. Males and females were found to differ in that females tended to score higher on Performance tasks while males were higher on Verbal tests. Approximately 13% of the sample was Black which is representative of the racial composition of UVA undergraduates. These students were found to score lower than whites on many subtests of the WAIS as well as VIQ and FSIQ. No generalization can be made as to whether this is true in the non-referred population. A very small number of graduate students was included in the sample, and they were found to score higher than undergraduates on PIQ, Arithmetic, Vocabulary, Information and Block Design. These latter two sets of results should be considered only suggestive given the small number of students which comprized the black and graduate samples.

Finally, 45% of the UVa sample received a personality assessment instrument. Only 2 students were found to have significant emotional conflicts. Two styles of coping with an LD problem were identified: those who cope with increased determination, goal orientation and creativity, and those who become depressed, pessimistic, rely on others for guidance, and are socially isolated. Future studies with this group of students should focus more explicitly on the styles of coping they adopt in the face of their learning/social difficulties. The present data, as well as that of Vogel (1982), suggests several immediate plans for intervention with the"poor copers." One clear tact is direct treatment to reduce the depressed and hopeless qualities many of these students present. Counseling which also reinforces the development

of autonomy and individuation would also be important to enable these students to be more self-determined or enhance their sense of self-efficacy (Bandura, 1977) in their approach to their own lives and abilities, and become more involved in creating new options and alternatives for themselves in personal, academic and career decision-making. Other important issues to address with the distressed LD student are their interpersonal concerns, particularly their complaints about social ineptness and inperception. Structured interpersonal skills/assertiveness groups would be one proposal. However, underlying questions about the nature and extent of the behavioral and cognitive deficits in this population need to be addressed empirically before intervention strategies can be adequately described.

One final issue that arises in the college LD population is that of diagnosis-specifically differential diagnosis of LD problems from more "purely psychological" ones. The UVA experience has been that many students with LD problems are not diagnosed prior to their admission. Suppose such a student were to seek professional help for his/her problems from persons unfamiliar with learning disabilities in this population. The following case illustrates the point.

> A 20 year old, 3rd year, white male was referred for counseling by one of his teachers because of a "chronic problem of not getting work in on time." The student reports that he has no trouble doing most of the work, but "forgets" when its due. On assignments which require independent thought and action, his papers are often rambling and unorganized. His one teacher has repeatedly asked him to come in to discuss these problems, but he misses the appointments and then says that they never had scheduled a meeting. This behavior is what was particularly upsetting to the teacher and what prompted his referral. Among his friends he's called "Zone" - because he's frequently "not there- in the ozone." For example, people will tell jokes and he laughs only after the others have and then continues laughing longer than the others. He also states that he has trouble "picking-up" on non-verbal behavior, and it seems that he is inept in other social situations. He has about a 2.5 GPA in history and has career plans to go to law school and be a defense attorney.

This case was presented to staff at our Counseling Center at a weekly case conference. Those present included 3 clinical psychologists, 3 counseling psychologists, 2 educational psychology counselors, 2 predoctoral clinical interns and 2 practicum level students. The question they were asked was how to diagnose this student. Their remarks and questions seem quite cogent. One intern who assessed LD students considered the presence of an auditory processing deficit. Other staff offered suggestions of depression, an organic syndrome of some sort, whether he was rebelling against authority, whether he was interested in the class or academics in general, and the possibility of a schizophrenia thought process. In all instances, psychotherapy was indicated.

The case was fictitious. It was based on 2 brief personality vignettes in the ACLD publication "Specific Learning Disabilities in the Adult Years," and supporting information from two specific cases seen by me who demonstrated (1) dyslogia, (2) Social imperception and (3) auditory processing problems. The moral of the story is that many LD problems (or symptoms) in this population can either go undiagnosed or be misdiagnosed by many professionals who may well be sought-out for help by these students.

The necessity for education of counselors, psychologists and other mental health professionals about LD problems appears quite important to avoid the mislabeling and inappropriate treatment of many of these individuals. Perhaps more important is research directed towards establishing methods to differentiate LD problems from psychological/emotional issues. Hopeful this research will enable both educational and psychological specialists to better serve the needs of this population.

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TABLE 1

Descriptive data of students referred for intellectual/ cognitive assessment by the Learning Needs and Evaluation Center (1980-1982).

Descriptive -	41 male 21 female	58 undergraduate 4 graduate	54 white 8 black

$\bar{x}$ age = 21.9 (s=5.6) range: 18-46

Variable	$\bar{X}$	S	Range	95% CI
VIQ	117.8	8.8	92-133	115.5-120
PIQ	115.9	9.6	92-140	113.5-118.4
FSIQ	118	7.8	102-136	116 -120
Information	13.1	1.9	8-18	12.6- 13.5
Comprehension	13.4	2.7	9-19	12.7- 14.1
Arithmetic	12.1	2.4	5-17	11.5- 12.7
Similarities	13.5	2.0	9-18	12.9- 14.0
Digit Span	11.8	2.8	6-18	11.0- 12.5
Vocabulary	13.4	1.9	7-17	12.9- 13.8
Digit Symbol	12.2	2.9	8-19	11.4- 13.0
Picture Completion	12.1	2.2	8-18	11.6- 12.7
Block Design	13.5	2.2	9-17	13 - 14.1
Picture Arrangement	11.4	2.5	1-17	10.8- 12
Oject Assembly	12.8	2.7	6-18	12.1- 13.5
Dig Fwd	6.9	1.2	4-9	6.6- 7.2
Dig Bwd	5.4	1.4	3-8	5.1- 5.8
Dig Diff	1.7	1.9	-2-11	1.2- 2.2

TABLE 2

Factor analysis of WAIS for Students referred for assessment by Learning Needs and Evaluation Center

Variable	1	2	3	4
Information	.76	.11	.13	.43
Comprehension	.19	.06	.57	.47
Arithmetic	.59	.04	.17	-.09
Similarities	.19	.37	.26	.33
Digit Span	.40	.05	.57	-.06
Vocabulary	.55	.10	.06	.34
Digit Symbol	-.02	.01	-.01	-.47
Picture Completion	.10	.54	.55	.10
Block Design	.43	.55	.02	-.05
Picture Arrangement	-.04	.57	.01	.09
Object Assembly	.36	51	.20	-.19
Eigenvalues:	3.37	1.49	1.32	1.05
Cumulative Percentage:	65.8			

Factor Naming

1 = Academic Skills
2 = Perceptual Abstraction
3 = Closure
4 = Verbal Fluency

TABLE 3

Summary of multiple discriminant for referred students by reason for referral (language waiver or other).

Significant Univariate F's (df=1,60)

Variable	1 means 2		F	P
FSIQ	116.7	121.9	5.681	.0203
Info	12.8	13.9	4.803	.0323
Vocab	13.0	14.3	5.694	.0202

MDA Summary Table

Variable	Wilks Lambda	P	1 means 2		canonical
Vocab	.9133	.02	13	14.3	.6091
PIQ	.8764	.02	114.6	119.8	.9307
BI Des	.8174	.008	13.5	13.6	-.8621
Info	.7973	.01	12.8	13.9	.4166

Eigenvalue = .25423 x^2= 13.138, df=4, p=.0106

Canonical r = .4502 Group centroids 1 -.2925

2 .8410

Classification Table

Actual	N	Predicted 1	Predicted 2
1 (Waiver)	46	42 (91.3)	4(8.7)
2 (Other)	16	9 (56.3)	7(43.8)

Total = 79.03%

TABLE 4

Summary of multiple discriminant for referred students by sex.

Significant Univariate F's (df = 1,60)

Variable	1 means 2		F	P
Info	13.5	12.2	6.505	.0133
Dig Sym	11.2	14.1	17.59	.0001

MDA Summary Table

Variable	Wilks Lambda	P	1 means 2		Canonical
Dig Sym	.7733	.0001	11.2	14.1	.6499
Dig Span	.7245	.0001	12.2	10.9	-.3744
BI Des	.6968	.0001	13.9	12.9	-.6813
PIQ	.6576	.0001	114.8	118.2	.4821
Simil	.6428	.0001	13.4	13.6	.3617
Info	.6205	.0001	13.5	12.2	-.5066
Vocab	.6017	.0001	13.5	13.0	.3498

Eigenvalues: .66201 x^2=28.704 df=7 p=.0002
Canonical r = .6311 Group Centroids 1 -.5728
2 1.1184

Classification Table

Actual	N	1 Predicted	2
1(male)	41	37(90.2)	4(9.8)
2(Female)	21	7(33.3)	14(66.7)

Total = 82.26%

TABLE 5

Summary of multiple discriminant for referred students by race (white or black).

Significant Univariate F's (df=1,60)

Variable	1 means 2		F	P
VIQ	118.8	111.1	5.63	.0205
FSIQ	118.9	111.5	6.94	.0107
Info	13.3	11.3	9.48	.003
Arith	12.4	10.3	5.89	.018
Vocab	13.7	11.1	15.01	.0003
BI Des	13.9	11.3	11.58	.0012
Dig Diff	1.4	3.6	10.66	.0018

MDA Summary Table

Variable	Wilks Lambda	P	1 means 2		Canonical
Vocab	.7998	.0003	13.7	11.1	-.5211
Dig Diff	.7214	.0001	1.4	3.6	.8154
BI Des	.6721	.0000	13.9	11.3	-.3790
Ob Ass	.6013	.0000	12.8	12.9	1.0781
PIQ	.5670	.0000	116.8	110.4	-.4370
Info	.5334	.0000	13.3	11.3	-.3303
Dig Bwd	.4896	.0000	5.5	4.9	.6727
Arith	.4671	.0000	12.4	10.3	-.4171
Pic Compl	.4466	.0000	12.3	11.1	-.4572
Comp	.4365	.0000	13.5	13.0	.3229
Simil	.4247	.0000	13.6	12.4	-.2609

Eigenvalue = 1.35441 x^2=46.668 df=1, p < .001
Canonical r = .7584

Group Centroids 1 -.4406
2 2.9744

Classification Table

Actual	N	1 Predicted	2
1(White)	54	53(98.1)	1(1.9)
2(Black)	8	0(0)	8(100)
	Total = 98.39%		

TABLE 6

Summary of mutiple discriminant for referred students by educational level (undergraduate or graduate).

Significant Univariate F's (df=1,60)

Variable	1 means	2	F	P
PIQ	115.1	128.3	7.727	.0073
FSIQ	117.3	127.5	6.895	.0110
BI Des	13.3	16.0	5.971	.0175

MDA Summary Table

Variable	Wilks Lambda	P	1 means	2	Canonical
PIQ	.8859	.0073	115.1	128.3	.6926
Arith	.8513	.0086	11.9	14.3	.5865
Vocab	.8316	.0130	13.2	15.0	.6023
Info	.8098	.0157	13.0	13.8	-.5149

Eigenvalue = .23484 x^2 = 12.235, df=4, p=.0157

Canonical r = .4361 Group Centroids 1 -.12519

2 1.81531

Classification Table

Actual	N	1 Predicted 2
1 (undergrad)	58	57(98.3) 1(1.7)
2 (grad)	4	2 (50) 2(50)
		Total= 95.16%

TABLE 7

Summary of personality descriptors for referred students receiving personality assessment instruments.

Male:	21	TAT:	23
Female:	7	MMPI:	4
		Rorschach:	1
Total	28		

"Positive" descriptors	n	"Negative" descriptors	n
determination	10	depressed	6
achievement oriented	5	authority-dependent	5
creative	5	hopelessness	5
good relations with authority	2	socially isolated	5
positive outlook	2	perfectionistic	4
social maturity	2	anxious	3
successful problem-solver	2	low frustration tolerance	3
acknowledge feelings	1	low self esteem	3
confident	1	psychologically naive	3
interpersonal sensitivity	1	self-critical	3
striving for autonomy	1	dichotomous thinking	2
		expressive difficuties on TAT	2
		poor problem-solving skills	2
		powerlessness	2
		reacts negatively to authority	2
		strives beyond capabilities	2
		uncomfortable with feelings	2
		acting-out under stress	1
		bored, unmotivated	1
		failure to mobilize supports	1
		inmature	1
		requires structure in life	1
		sensitive to criticism	1
		sex-role issues	1

Note: Two students diagnosed with significant emotional conflicts contributing to learning difficulties.